Discharge Communiqué: Use of A Workflow Byproduct To Generate an Interim Discharge Summary

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Abstract: *Medical problems left unresolved during hospitalizations (along with recommended outpatient evaluations, test results pending at discharge, and discharge medication regimens) are often documented in patients' discharge summaries. However, studies have demonstrated that discharge summaries are frequently unavailable or inaccessible at post discharge visit(s). Interim discharge summaries have been shown to improve the flow of information between inpatient and outpatient physicians. We have constructed a web-based solution, discharge communiqués that are very much like interim discharge summaries but are an automatic byproduct of an every day workflow process, signout. The New SignOut System captures signout information and generates discharge communiqués immediately upon discharge. From June 2002-January 2003 7926 discharge communiqués were made available on 7926 patients and there were 12,920 look-ups of communiqués. Studies concur that 40-50% of patients will not have an available discharge summary making communiqués the primary source of clinical information on prior hospitalization for outpatient physicians.*

Introduction

Patients hospitalized for acute medical conditions are often discharged from the hospital with unresolved subacute and chronic medical problems that do not require emergent inpatient evaluation. The evaluation of these unresolved medical problems is expected to be conducted on an outpatient basis by patients' primary care physicians (PCPs). The most likely vehicle for documented communication would appear to be the discharge summary, yet multiple studies demonstrate that discharge summaries are frequently not available to the PCP at the time of post discharge visit[1-5]. Poor dissemination of discharge summaries to outpatient PCPs may adversely affect patient outcomes. Van Walraven and colleagues demonstrated this when they showed a trend toward decreased re-hospitalizations for patients that were assessed by PCPs who had access to their discharge summaries (relative risk 0.74, 95% confidence interval 0.50 to 1.11) [6]. However, in the same study, discharge summaries were only available for 12.2% of post-discharge PCP visits.

We have constructed a web-based solution; discharge communiqué's to provide PCP's with information about hospitalization immediately available upon discharge. Our hypothesize is that there is a pent up demand for information about hospitalizations by both outpatient PCP's as well as inpatient providers because of the less than ideal completion rates, availability, and accessibility of discharge summaries. In this paper, we describe our solution, discharge communiqués, and the data on generation and usage of communiqués.

Background

In a study by Moore, et al.[7], approximately 52% of patients discharged from an inpatient general medicine service had planned outpatient tests or procedures for one or more unresolved medical issues. In the same study, approximately 17.9% of patients had test results that were still pending at the time of hospital discharge. Medical problems left unresolved during hospitalizations (along with recommended outpatient evaluations, test results that are pending at the time of discharge, and discharge medication regimens) are often documented in patients' discharge summaries.

However, studies have shown that less than half of all PCPs are provided information about the discharge medications and plans for their recently hospitalized patients [1-5]. For example, in a study by van Walraven and colleagues[5], only 8.2% of discharge summaries were available to outpatient PCPs at the initial post-discharge visit and no summaries were available for any post-discharge visits for 68.4% of patients. Summaries were most commonly unavailable because they were not generated in time for the follow-up visit (20.0%) or they were not sent to the follow-up PCP (50.8%). Similarly, in a study by Wilson and colleagues[2], only 27.1% of outpatient PCPs ever received patients' discharge summaries. Even when available discharge summaries may not always contain the information outpatient providers require[1, 8-10].

This area of inquiry has important clinical and policy implications given the growing prevalence of the hospitalist model as a recent organizational innovation in health care[11, 12]. Some investigators have expressed concern that this comes at the expense of inpatient-to-outpatient continuity of care and that, as a result, patient care during the immediate post-discharge period may suffer [4, 12-15]. Thus, the hospital discharge summary becomes an increasingly important resource for maintaining inpatient-to-outpatient continuity of care as the hospitalist model continues to expand.

The concept of interim or early-discharge summaries has been advanced as an alternative vehicle for transmission of information about hospitalization. These summaries would be made immediately available upon discharge and would include changes in medication, discharge plans, and information about hospital course[16]. In-

terim discharge summaries have been shown to result in expedited delivery of inpatient information to outpatient providers [17, 18]. We have developed a web-based equivalent of interim discharge summaries, the discharge communiqué, which are generated as a byproduct of a daily workflow process, signout. Signout information is captured and stored by the New SignOut System (Figure 1).

Figure 1 New SignOut

At our institution, at the end of every working day, inpatient housestaff must signout to the on-call team. Residents generate patient lists and include information that the on-call team needs to be aware of for the night or the weekend. Information that the residents supply for signout is entered directly into the New SignOut System and updated at the end of each day by house staff using computer terminals located throughout the hospital. Daily updates often include adding or discharging patients from New SignOut, modifying medication lists, and updating problem lists. After signout information is updated and saved, a printed copy is given to the on-call housestaff who use it to care for patients during the overnight period when patients' primary attendings and house staff have left the hospital for the day. This data includes information about each patient's history of present illness, current diagnosis, medication list, and problem list, and other issues of concern (Fig. 1).

Computerized signout's have been previously described in the literature[19, 20]. The New SignOut system is the redesigned integrated enterprise version of the SignOut system described previously[21]. The front end of the New SignOut System is written in Java and JSP and resides on a Solaris web server. The backend database is an Oracle 8I database residing on a R6000 AIX machine. Integration of the New SignOut System with our clinical repository, "Enterprise Data Repository" (EDR), ensures automated transfer of patient demographics and continuous updating of patient location (i.e., bed and floor) from EDR. Communiqués are produced when patients are discharged from the New SignOut System.

Methods

Communiqués are web-based documents that are accessible via EDR to all physicians in training and/or have admitting privileges at Mount Sinai Medical Center. Upon discharge housestaff remove patients from the New SignOut patient list by selecting the discharge button. The resident is then taken to the discharge communiqué screen in which he or she can edit and review the communiqué. If sign and discharge communiqué are selected, a warning, indicating that communiqué will be added irrevocably to EDR, is put on screen with a yes or no option. Upon completion of the communiqué, the patient is removed from SignOut's patient list, immediately added to and instantly accessible via EDR. In addition to communiqués, the EDR contains test results, images, radiology and pathology reports, etc.

Figure 2. Discharge Button

Figure 3. Communiqué Edit & Review

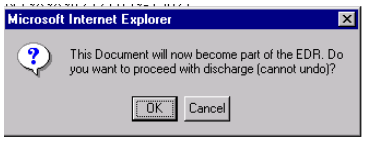

Figure 4. Sign & Add to EDR

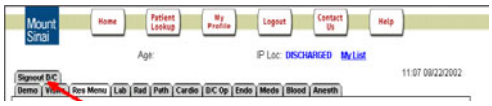

Figure 5. Retrieving Communiqué's in EDR

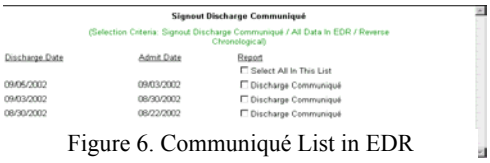

Figure 6. Communiqué List in EDR

Access to discharge communiqués in EDR is provided via web browser. Onsite access is through web our secure Intranet while offsite access is via our Extranet with VPN security. A pass through of user id and password from order entry system Eclipsys 7000, provides EDR authentication. The user sees the same id and pass-

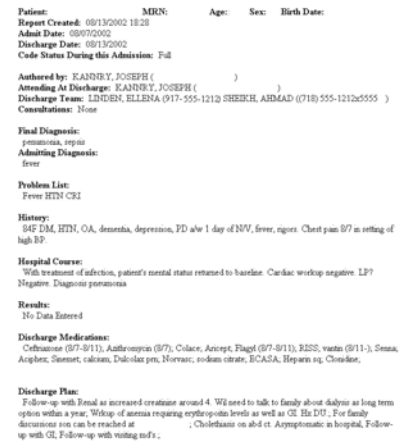

Figure 7. Discharge Communiqué

word for both order entry system and EDR. Security is HIPAA compliant.

There are three innovations in the discharge communiqués: 1.) Generation of communiqués as a by-product of daily workflow, 2.) Self-designated provider names and pagers, and 3.) Post-discharge reminders.

On day of discharge from hospital, residents remove patients from their patient list in New SignOut by generating a discharge communiqué. The communiqué is pre-populated by the product of daily workflow, signout information and as a result there have been few complaints about increased workload. This information includes attending and housestaff physician names and pager numbers, name and pager of discharging physician (author of communiqué), admitting diagnosis, discharge diagnosis, code status, hpi, pmhx, hospital course, problem list, medications, allergies, relevant test results, and consultant names. Physicians may modify and review old information as well as include additional information such as planned outpatient tests and procedures, and test results that are pending at the time of discharge. Users receive no prompting to modify or review information. Discharge plan is pre-populated with post discharge reminders (see below).

Self-designation occurs as part of routine daily workflow during the hospital stay. Residents designate themselves and attendings as the primary providers of care in New SignOut as part of routine creation and modification of patient lists and then the provider information is saved in the discharge communiqué. Supplying this information in the communiqué allows outpatient providers to contact the inpatient providers directly. The accuracy of self-designation of provider names was previously studied in the Old SignOut System and shown to be 90-100% for attendings and 80-90% for housestaff[21, 22]. These numbers were significant improvements over hospital rates of 50-60% accuracy for attendings and no storage of housestaff names upon discharge.

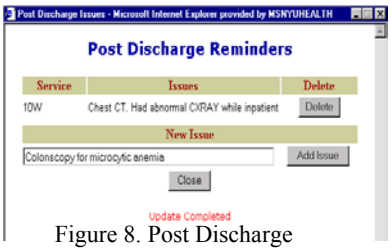

Figure 8. Post Discharge

Innovation three involves use of post-discharge reminders. Frequently during a hospital stay, issues needing further work-up and testing are identified. Unfortunately, many of these follow-up issues are not addressed. Errors of omission occur in which post discharge issues requiring outpatient follow-up are noted in inpatient charts but not mentioned in discharge documentation. For example, a patient admitted with pneumonia may have an incidental finding of iron deficiency anemia and require a colonoscopy upon discharge. Housestaff may generate a post discharge reminder at any time during hospital stay and this reminder (e.g., "get colonoscopy"), will automatically appear in the discharge planning section of the communiqué.

Results

Table 1 lists new discharge communiqués by month. The growth in communiqués parallels the rollout of the New SignOut System, which generates the communiqués. New SignOut went live as a pilot from December 2002-April 2003 with 9 housestaff users per month with ~ 200 new discharge communiqués per month. The system went live for all

Table 1 Communiqués Newly Available By Month	
Jun-02	741
Jul-02	942
Aug-02	852
Sep-02	788
Oct-02	895
Nov-02	901
Dec-02	873
Jan-03	922
	7926

Medicine and Pediatric housestaff in May-June 2003 and a concurrent surge in new communiqués from June 2003 onward. Subsequent rollouts were to 2 Attending Directed Service's (ADS): Telemetry and

Table 2 Lookups By Month	
Jun-02	107**
Jul-02	786
Aug-02	1019
Sep-02	1239
Oct-02	1833
Nov-02	2007
Dec-02	2401
Jan-03	3580
	12972

Geriatrics. On ADS, NP's are the SignOut users. By January 2003, there were 140 users per month and 7926 communiqués available.

Communiqué look-ups in EDR per month are shown in table 2. Prior to June 28, 2002 communiqués were not accessible from EDR. Discharge communiqués have been looked-up ~13000 times in the six month period from June 2002-January 2003.

Discussion

Discharge communiqués are a form of interim discharge summaries that are instantly available. Availability without delay is critical, as patients discharged from Mount Sinai Hospital are required to have a follow-up outpatient appointment within 2 weeks. At our institution discharge summaries may be unavailable because they are never dictated, are being transcribed, are handwritten and filed in an inaccessible hospital chart, or were never handwritten at all. Upon discharge patients are given a difficult to read carbon copy of a sometimes-legible nursing discharge note. The handwritten information from busy nurses contains diagnosis, medications and follow-up but otherwise is sparse.

Clinical information systems such as those at Columbia, Brigham, BI, Montefiore, and Sinai EDR (dictated only) all contain discharge summaries. However, discharge summaries are unavailable or not completed at the time of the post discharge visit over 50% of the time[1-5]. Medical records at Mount Sinai Medical Center estimates that ~40% of charts do not have discharge summaries at 30 days. These numbers suggest that ~3200-4000 (40-50% of 7926) patients in our study would not have available discharge summaries. Communiqués provide the most complete information available for patients without discharge summaries. The availability rate of discharge summaries for outpatient physicians at our institution may be even lower since discharged patients need to seen within 2 weeks of discharge date. Without communiqués, the outpatient physician is forced to play detective searching the EDR for clues in visit history, test results, ER notes etc.

The communiqués also provide information that discharge summaries traditionally do not such as admitting and discharge diagnosis, code status during admission and post-discharge reminders and contact information. Since the communiqués were also designed to facilitate communication, contact information includes provider names and pagers during admission, consultant names and pager numbers. Inadequate communication between physician particularly with inpatient to outpatient providers of care[7, 23] is a source of adverse events

The number of monthly lookups of discharge communiqués demonstrates a frequent need for information about previous hospitalization. In the first two days of availability, June 28th-30th there were 107 look-ups. In the six month period from July 2002 -January2003, there were ~ 13,000 lookups. A noticeable and sustained increase of lookups per month, 600, occurred from October onward which may be due to multiple factors. The winter months are the hospitals busiest time of year and the increased lookups reflect increased number of admissions and discharges. The hospital instituted a successful program to reduce length of stay that resulted in concurrent increase in patient turn over and a resulting increase number of lookups on new admissions. Finally, the New SignOut was rolled out to ADS Telemetry, a high volume service. It is unclear why the number of lookup's jumped even higher to ~3600 in January.

One limitation of our study is the way lookup's were counted. There is no direct correspondence between number of lookups and number of communiqués retrieved. A lookup event occurs when a selects the "SignOut DC " or communiqué tab in EDR (Figure 5). One lookup may include multiple communiqués from multiple prior hospitalizations (Figure 6) or be unsuccessful with no communiqué found. However, the steady and sometimes dramatic growth in number of lookups (Table 2), suggests use due to success. The number of unsuccessful lookups over time inevitably declines as the system is populated with more communiqués from recent admissions and newly added services.

Another limitation of our analysis is that we cannot easily tell in what setting the lookup occurred. The need for communiqués in the hospital may be as great as the need for communiqués in the outpatient setting. In the hospital discharge summaries may be unavailable for many of the same reasons that were true for the outpatient setting. Summaries are frequently unavailable because the summaries were never dictated, were never handwritten, or are being transcribed. The only difference between inpatient and outpatient settings is access to the old hospital chart is easier within the hospital. Therefore the demand for information about prior hospitalizations by inpatient physicians may be quite high

Our study found that over 7926 communiqués were made readily available after discharge. Completion of communiqués is facilitated by pre-population of communiqué by New SignOut data. There is a huge incentive to complete discharge communiqués rapidly upon discharge from hospital because patients remain in the SignOut till discharge communiqué are completed. If the communiqué is not done, the patient list in SignOut quickly becomes cluttered with discharge patients whose room location reads "discharged". However, coverage schedules designed to comply with NYS regulation of housestaff working hours[24, 25], can result in the housestaff team being out of hospital for 1-2 days. In these circumstances completion of communiqués could be delayed because the housestaff, that know the patient best, are not in the hospital. It is unclear if a covering housestaff team will discharge another team's patients from New SignOut to clean up SignOut patient list or wait for the original team to return and discharge the patient out of SignOut.

Our study was limited to looking at communiqué production and use by all Medicine and Pediatric Housestaff Services, and two ADS services with NP users. New SignOut rollout across the hospital, which is ongoing, is required to pre-populate and produce communiqués for all services. Services added to New SignOut since the study, include: Neurology, Psychiatry, General and Vascular Surgery, Geriatrics, and Nephrology. The study environment is limited to one academic hospital, Mount Sinai, but New SignOut with discharge communiqués is being piloted at Tish-NYU.

It was outside the intended scope of this study to assess the impact of communiqués on patient care and medical errors. Our follow-up study, already underway, will address this question as well as assess the information quality in communiqués.

Conclusion

Discharge summaries, the major source of information about hospitalization are frequently unavailable[1-5,16]. Interim discharge summaries have been shown to be one solution to making information about hospitalization readily and rapidly available[17, 18]. We have developed

a form of interim discharge summaries, web-based discharge communiqués, to provide timely information about hospitalizations. The discharge communiqués are immediately available upon discharge and accessible in a secure HIPAA compliant mechanism by any offsite or onsite physicians affiliated with Mount Sinai Hospital. The demand for communiqués has been steadily increasing and after six months there were 13000 communiqué lookups. Our hospital believes that the mandatory and immediate completion of communiqués is desirable for discharge summaries as well. We are now in exploring ways to transform communiqués into discharge summaries.

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